I claim:

1. A lightwave electromagnetic antenna for the purpose of sending and receiving electromagnetic energy, said electromagnetic antenna having a linear conductor electrically connected to a substrate material,
said linear conductor having an electrical length sized to respond to an electromagnetic light wavelength.

2. The lightwave electromagnetic antenna as recited in claim 1, wherein said linear conductor is oriented generally perpendicular to said substrate material.

3. The lightwave electromagnetic antenna as recited in claim 1, wherein said linear conductor is comprised of a carbon nanotube.

4. The lightwave electromagnetic antenna as recited in claim 1, wherein said electrical length of said linear conductor is sized to correspond to infrared, visible or ultraviolet light.

5. The lightwave electromagnetic antenna as recited in claim 1, wherein said linear conductor is attached to said substrate material at one end of said linear conductor.

6. A lightwave electromagnetic device having a linear conductor attached to a junction, said linear conductor having an electrical length sized to respond to light wavelength energy, said junction having a non-linear electrical charge transfer characteristic.

7. The lightwave electromagnetic device as recited in claim 6,
wherein said junction is comprised of a nanoparticle.

8. The lightwave electromagnetic device as recited in claim 6,
wherein said junction is comprised of a semiconducting substrate.

9. The lightwave electromagnetic device as recited in claim 6,

wherein said junction is electrically connected to a further electrical port.

10. A method of generating harmonic energy near light wavelengths comprising the steps of:

exposing a conductor to an infrared, visible or ultraviolet electromagnetic light energy having an alternating waveform,

inducing a current with said electromagnetic energy in said conductor to cause an electrical charge to cross a junction,

emitting at least a portion of said energy at a harmonic multiple of said light energy from said junction.

11. A device for rectifying an alternating waveform occurring around light wavelengths comprising;

a short conductor of less than 10,000 nanometers in length, and,

a nonlinear region with an electrical length less than a light wavelength attached to at least one end of said short conductor.

12. The device for rectifying an alternating waveform occurring around light wavelengths as recited in claim 11,
wherein said short conductor is comprised of a carbon nanotube.

13. The device for rectifying an alternating waveform occurring around light wavelengths as recited in claim 11,
wherein said nonlinear region is adjacent to one end of said short conductor.

14. A lightwave electromagnetic antenna having a linear conductor attached to a substrate material,
said linear conductor having an electrical length sized to respond to an electromagnetic light wavelength.

15. The lightwave electromagnetic antenna as recited in claim 14,
wherein said short linear conductor is in a range of 60 to 10,000 nanometers in length.

16. The lightwave electromagnetic antenna as recited in claim 14, wherein said linear conductor is elongated and has a high length-to-diameter ratio.

17. The lightwave electromagnetic antenna as recited in claim 14, wherein said substrate material is at least partly comprised of a solid semiconducting material.

18. The lightwave electromagnetic antenna of claim 17, wherein said semiconducting material is a foraminous semiconducting material.